

뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Differences in the injury of neural tracts for motor function in mild TBI patients with whiplash

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Objectives

We investigated injury differences between the corticospinal tract (CST) and the corticoreticulospinal tract (CRT), major neural tracts for motor function, in mild traumatic brain injury (mTBI) patients with whiplash by using diffusion tensor tractography (DTT).

Methods

We recruited 41 mTBI patients with whiplash and 43 healthy control subjects for this study. The CST and CRT were estimated in both groups based on two DTT parameters, fractional anisotropy (FA) and tract volume (TV).

Results

A significant difference was not detected in the FA values for the CST between the patient and control groups ($p > 0.05$). However, the FA value for the CRT in the patient group was significantly lower than that of the control group ($p < 0.05$). Regarding the TV of the CST, a significant difference was not detected between the patient and control groups ($p > 0.05$) whereas the TV value of the CRT in the patient group was significantly lower than that of the control group ($p < 0.05$).

Conclusions

The results indicate that CRT injury can occur without CST injury in mTBI patients with whiplash. The CRT injury appeared to be associated with the anterior portion of the CRT compared with that for the CST. Our results suggest that neural tracts in the anterior portion of the brain might be more vulnerable to whiplash injury than those in other areas

Acknowledgment : This work was supported by the National Research Foundation(NRF) of Korea Grant funded by the Korean Government(MSIP) (NRF-2018R1A6A3A11050913).

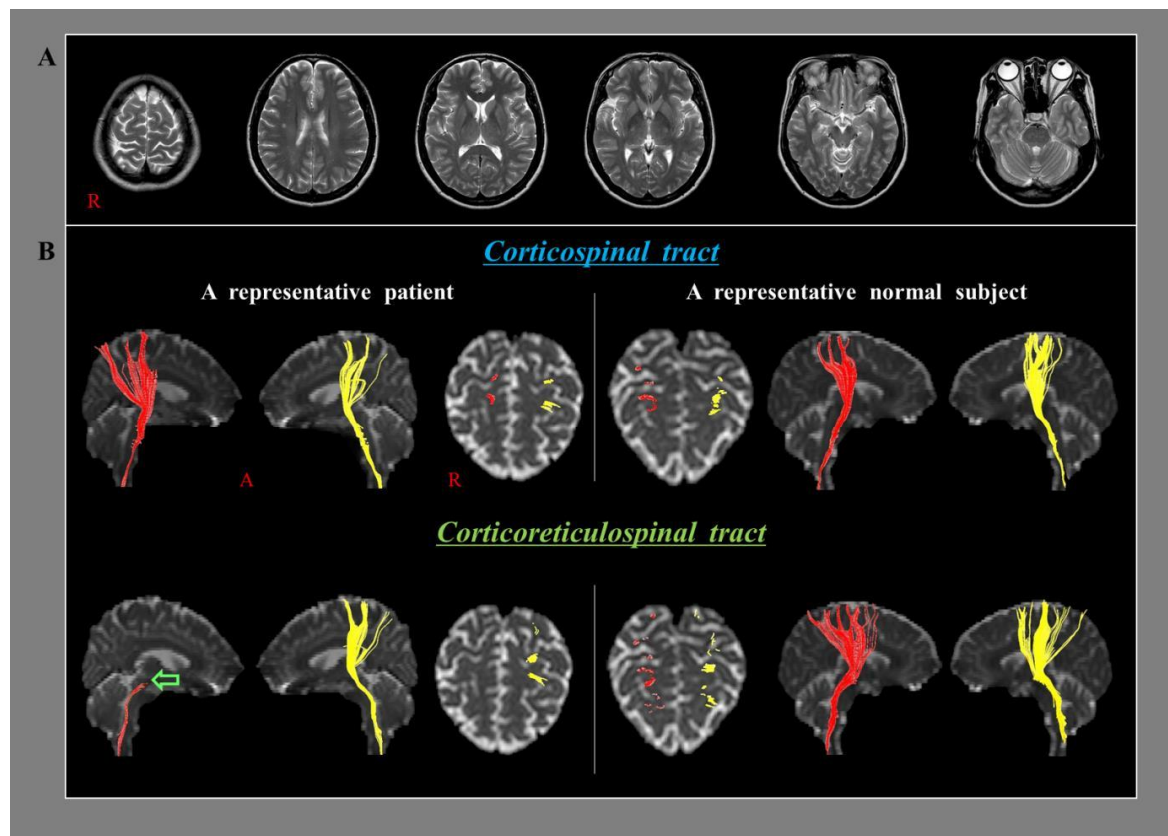


Figure. 1 Results of diffusion tensor tractography (DTT) of the corticospinal tract (CST) and the corticoreticulospinal tract (CRT). (A) T2-weighted brain magnetic resonance images of a representative patient (51-year-old male). (B) Results of DTT of the CST and CRT in a representative patient (51-year-old male) and representative normal subject (53-year-old male). The integrity of the CST is preserved in both the patient and the normal subject. However, the CRT shows discontinuation in the right hemisphere (green arrow) of the patient.

Table 1. Demographic characteristics of the patient and control groups.

	Patients	Control
Mean age (years)	49.05 ± 11.36	51.25 ± 9.21
Sex (male:female)	18:23	20:23
Mean duration to DTT from onset (days)	142.50 ± 259.81	

Values are presented as means ± standard deviation; DTT: diffusion tensor tractography.

Table 2. Comparison of diffusion tensor tractography parameters for the corticospinal tract and the corticoreticulospinal tract in the patient and control groups.

		Patient group	Control group	<i>p</i> -value
			CST	
	FA	0.55 ± 0.02	0.56 ± 0.01	0.26
DTT ↓	TV	2067.58 ± 759.81	2123.41 ± 639.67	0.46
parameter			CRT	
	FA	0.49 ± 0.03	0.52 ± 0.04	0.01*
	TV	1298.71 ± 569.81	1923.14 ± 391.14	0.01*

DTT: diffusion tensor tractography; CST: corticospinal tract; CRT: corticoreticulospinal tract; FA: fractional anisotropy; TV: tract volume.